

IN THE CLAIMS:

1. (original) In a computer system having a user interface including a display and a user interface selection device, a process for graphically displaying the results of a search to a user on said display via an interactive search results window in which the user views and filters search results items, comprising process actions for:

computing a clustering of the search results items in terms of a user-specified independent variable corresponding to a common attribute of at least some of the search results to form a plurality of cluster subdivisions each comprising a portion of the search results items within a particular range of the independent variable determined by the clustering;

displaying a graphic data presentation sector in the search results window which comprises a series of said cluster subdivisions displayed in the order dictated by the independent variable, wherein each subdivision is visually distinguished from the other subdivisions and has a length along the axis of the independent variable proportional to the number of search results items within that subdivision; and

upon the user selecting one of the cluster subdivisions via said selection device, those search results items associated with the selected subdivision are re-clustered and cluster subdivisions associated with the re-clustered search result items are displayed in the graphic data presentation sector in lieu of the previously displayed higher-order clustering, thereby effecting a user specified filtering of the search results.

2. (original) The process of Claim 1, further comprising displaying a search results counter in the search results window which displays the total number of search results items included in all the cluster subdivisions currently displayed in the graphic data presentation sector.

3. (original) The process of Claim 1, further comprising displaying a list sector in the search results window which displays a listing of at least some of the search results items included in the cluster subdivisions currently displayed in the graphic data presentation sector.

4. (original) The process of Claim 3, wherein the number of search result items included in the cluster subdivisions currently displayed in the graphic data presentation sector is too large for all of them to be displayed in the space allotted to the list sector in the search results window, and wherein the search results window further comprises a graphic scroll bar displayed adjacent the list sector which the user employs to bring search results items hidden from view due to the space limitation into view.

5. (original) The process of Claim 3, wherein the search results items comprise electronic files, and said listing of the search results items comprises a listing of file names associated with each of the files.

6. (original) The process of Claim 3, wherein the search results items comprise electronic files, and said listing of the search results items comprises a listing of file names and one or more attributes associated with each of the files.

7. (original) The process of Claim 3, wherein the search results items comprise electronic image files, and said listing of the search results items comprises a listing of file names and a thumbnail image representative of the image data of the file.

8. (original) The process of Claim 3, wherein the list sector is displayed or not displayed in the search results window based on a user-specified preference.

9. (original) The process of Claim 8, further comprising displaying a list sector display button in the search results window which when selected by the user when the list sector is displayed causes the list sector to be hidden from view, and which when selected by the user when the list sector is hidden from view causes the list sector to be displayed.

10. (original) The process of Claim 3, further comprising displaying a range list in the list sector of the search results window comprising a listing of the independent

variable range and the number of search results items associated with each cluster subdivision currently displayed in the graphic data presentation sector.

11. (original) The process of Claim 10, wherein the process action of displaying the range list comprises an action of visually distinguishing each listing in the same way as the cluster subdivision associated therewith is distinguished in the graphic data presentation sector.

12. (original) The process of Claim 10, wherein at any one time either the range list or the listing of search results items is displayed in the list sector, but not both, and wherein the user specifies which is to be displayed.

13. (original) The process of Claim 1, wherein the user-specified independent variable corresponding to a common attribute of at least some of the search results comprises one of (i) a date associated with a search results item, (ii) a search result item type, and (iii) a file size of a search results item.

14. (original) The process of Claim 1, wherein the process action of displaying the graphic data presentation sector further comprises an action of displaying a scale for the independent variable comprising periodically placed alphanumeric characters and markings indicating the value of the independent variable at the location where it is display along the independent variable axis.

15. (original) The process of Claim 1, wherein the proportional length of said subdivisions is based on one of (i) linear proportionality, or (ii) logarithmic proportionality.

16. (original) The process of Claim 1, further comprising displaying a range list sector in the search results window which displays a listing of the independent variable range and the number of search results items associated with each cluster subdivision currently displayed in the graphic data presentation sector.

17. (original) The process of Claim 16, wherein the process action of displaying the range list sector comprises an action of visually distinguishing each listing in the same way as the cluster subdivision associated therewith is distinguished in the graphic data presentation sector.

18. (original) The process of Claim 1, wherein the process action of displaying the graphic data presentation sector further comprises an action of displaying a histogram of the search results items, in terms of the user-specified independent variable, over the cluster subdivisions, wherein the bars of the histogram each represent a histogram bin corresponding to a particular range of the independent variable and each have a length proportional to the number of search results items determined to be in the associated bin and extend perpendicular to the independent variable axis, and wherein the independent variable range covered by the histogram bins associated with bars displayed within each cluster subdivision falls within the independent variable range of that subdivision.

19. (original) The process of Claim 18, wherein whenever the user selects one of the cluster subdivisions via said selection device, the process action of displaying a histogram of the search results items comprises an action of displaying a new histogram computed for just those search results items associated with the selected cluster subdivision which is displayed in the graphic data presentation sector in lieu of the previously displayed higher-order histogram

20. (original) The process of Claim 18, wherein the user can specify whether the histogram is displayed or hidden from view.

21. (original) The process of Claim 1, further comprises a process action of the user continuing to select a cluster subdivision of the currently-displayed clustering each time a previous selection has resulted in a new clustering being computed for just those search results items associated with the selected subdivision and displayed in the

graphic data presentation sector.

22. (original) The process of Claim 1, further comprising displaying an overview sector in the search results window comprising continuously displaying an overall clustering computed from the complete set of search results in terms of said user-selected independent variable corresponding to a common attribute of at least some of the search results.

23. (original) The process of Claim 22, further comprising displaying an indicator pane covering the portion of said overall clustering displayed in the overview sector corresponding to the search results items used to compute the clustering currently displayed in the graphic data presentation sector, said indicator pane being visually distinguished from the remaining parts of the overall clustering.

24. (original) The process of Claim 3, further comprising the process actions of:
displaying a guide pane over a fractional region of the displayed cluster subdivisions along the axis of the independent variable, said guide pane being visually distinguished from the cluster subdivisions but allowing the cluster subdivisions to be seen through the guide pane and representing a currently highlighted portion of the search result items corresponding to the cluster subdivisions covered thereby;
displaying a highlighting pane over at least a portion of the search results items listed in said list sector, wherein the highlighting pane is visually distinguished from the listed search results items in a manner that allows the items to be seen through the highlighting pane, and wherein the search result items covered by the highlighting pane correspond to the search result items associated with the cluster subdivision or subdivisions or parts thereof covered by the guide pane.

25. (original) The process of Claim 24, wherein the process action of displaying a highlighting pane comprises an action of displaying the highlighting pane in a manner similar to the way the guide pane is visually distinguished from the cluster subdivision so as to indicate to the user that the guide pane and highlighting pane are related.

26. (original) The process of Claim 24, wherein the size of the fractional region associated with the guide pane along the independent variable axis is large enough to encompass all the search result items that are able to be displayed in the list sector in view of the space allotted the list sector.

27. (original) The process of Claim 24, wherein the size of the fractional region associated with the guide pane along the independent variable axis is not large enough to encompass all the search result items that are displayed in the list sector, thereby resulting in the highlighting pane covering only a portion of the search results items being displayed in the list sector.

28. (original) The process of Claim 24, further comprising a process actions of, in response to a user moving the guide pane along the independent variable axis of the cluster subdivisions to highlight a desired portion thereof, moving the highlighting pane to cover those search result items listed in the list sector corresponding to the search result items associated with the cluster subdivision or subdivisions or parts thereof covered by the guide pane.

29. (original) The process of Claim 28, wherein the process action of moving the highlighting pane in response to a user moving the guide pane, comprises an action of, whenever the number of search results items associated with the cluster subdivisions exceeds that which can be displayed at one time in the list sector and the user moves the guide pane to cover a portion of the cluster subdivisions that is associated with search results items not currently displayed in the list sector, scrolling the search result items so as to bring the items associated with the portion of the cluster subdivisions covered by the guide pane into view in the list sector.

30. (currently amended) The process of Claim 3, wherein the process action of displaying the list sector comprises an action of displaying search results items in ~~aesending~~ ascending order in regard to the independent variable, and in one of columns

or rows, on a cluster subdivision-by-subdivision basis, such that each successive column or row associated with a particular subdivision displays as many search results items as will fit in the space allotted for a respective full column or row in the list sector or as many search result items as there are left in the subdivision which are not displayed in a preceding column or row.

31. (original) The process of Claim 30, wherein the process action of displaying the graphic data presentation sector further comprises the actions of:

displaying a pseudo histogram map of the search results items over the cluster subdivisions, wherein the pseudo histogram map has bars oriented perpendicular to the independent variable axis each of which represents a column or row of search results items as they would be displayed in the list sector and each of which has a length proportional to the number of search results items represented; and

displaying each cluster subdivision with a width, while still proportional to the number of search results associated therewith, that is long enough so that all the pseudo histogram map bars representing the search results items of the subdivision are displayed within the subdivision.

32. (original) The process of Claim 31, wherein the process action of displaying the pseudo histogram map comprises an action of displaying the bars thereof as a series of separated co-linear blocks each of which represents the same number of search results items.

33. (original) The process of Claim 32, wherein each pseudo histogram map bar block represents one search results item.

34. (original) An interactive search results presentation system, comprising:
a general purpose computing device comprising a display and a user interface selection device; and

a computer program comprising program modules executable by the computing device, wherein the computing device is directed by the program modules of

the computer program to graphically display the results of a search to a user on said display via an interactive search results window in which the user views and filters search results items on the display, said search results window comprising,

a graphic data presentation sector which displays a histogram of the search results items in terms of a user-specified independent variable corresponding to a common attribute of at least some of the search results, wherein the bars of the histogram each represent a histogram bin corresponding to a particular range of the independent variable and each have a length proportional to the number of search results items determined to be in the associated bin; and

a selection pane covering a fractional region of the displayed histogram along the axis of the independent variable, said selection pane being visually distinguished from the remaining parts of the histogram and representing a currently highlighted portion of the histogram; and wherein

upon user-selection of the portion of the histogram highlighted by the selection pane, a new histogram is computed for just those search results items associated with the selected portion of the histogram and displayed in the graphic data presentation sector in lieu of the previously displayed higher-order histogram, thereby effecting a user specified filtering of the search results.

35. (original) The system of Claim 34, wherein the user-specified independent variable corresponding to a common attribute of at least some of the search results comprises one of (i) a date associated with a search results item, (ii) a search result item type, and (iii) a file size of a search results item.

36. (original) The system of Claim 34, wherein the length of the bars of the histogram are scaled such that the bar representing the histogram bin having the most search results items extends a prescribed maximum length perpendicular to the independent variable axis of the histogram and the length of the other bars is scaled proportionally depending on the number of search results items in the bar's associated histogram bin.

37. (original) The system of Claim 36, wherein the prescribed maximum length of the histogram bars is the entire extent of the graphic data presentation sector in the direction perpendicular to its independent variable axis.

38. (original) The system of Claim 36, wherein the proportional length of said other bars is based on one of (i) linear proportionality, or (ii) logarithmic proportionality.

39. (original) The system of Claim 34, wherein the space allotted for the display of the graphic data presentation sector within the search results window dictates the resolution of the histogram.

40. (original) The system of Claim 39, wherein the number of bars in the histogram and the independent variable range of the bin associated with each bar is dictated by the length of the displayed graphic data presentation sector in the direction of the independent variable axis of the histogram in that the maximum number of bars having a prescribed width in the direction of the independent variable axis that can be displayed are displayed with each bin represented by a bar having an independent variable range equal to a total range of the independent variable associated with the search results items divided by the number of bars displayed.

41. (original) The system of Claim 39, wherein the length of each histogram bar is determined in increments representing a particular number of search results items wherein the number of search results items in the histogram bin represented by a bar is divided by the number associated with the bar increment to determine the number of increments to be used to display the bar.

42. (original) The system of Claim 41, wherein whenever said division results in a remainder, the number of increments used to display a bar is one of (i) rounded down, (ii) rounded up, (iii) rounded up if the remainder is more than half the number associated with the bar increments and rounded down if the remainder is equal to or less than half the number associated with the bar increments, or (iv) rounded up if the remainder is

equal to or more than half the number associated with the bar increments and rounded down if the remainder is less than half the number associated with the bar increments

43. (original) The system of Claim 34, wherein the search results window further comprises a search results counter which displays the total number of search results items included in all the bins of the histogram currently displayed in the graphic data presentation sector.

44. (original) The system of Claim 34, wherein the search results window further comprises a list sector which displays a listing of search results items included in the bins of the histogram currently displayed in the graphic data presentation sector.

45. (original) The system of Claim 44, wherein the number of search result items included in the bins of the histogram currently displayed in the graphic data presentation sector is too large for all of them to be displayed in the space allotted to the list sector in the search results window, and wherein the search results window further comprises a graphic scroll bar displayed adjacent the list sector which the user employs to bring search results items hidden from view due to the space limitation into view.

46. (original) The system of Claim 44, wherein the search results items comprise electronic files, and said listing of the search results items comprises a listing of file names associated with each of the files.

47. (original) The system of Claim 44, wherein the search results items comprise electronic files, and said listing of the search results items comprises a listing of file names and one or more attributes associated with each of the files.

48. (original) The system of Claim 44, wherein the search results items comprise electronic image files, and said listing of the search results items comprises a listing of file names and a thumbnail image representative of the image data of the file.

49. (original) The system of Claim 44, wherein the list sector is displayed or not displayed in the search results window based on a user-specified preference.

50. (original) The system of Claim 49, wherein the search results window further comprises a list sector display button which when selected by the user when the list sector is displayed causes the list sector to be hidden from view, and which when selected by the user when the list sector is hidden from view causes the list sector to be displayed.

51. (original) The system of Claim 34, wherein the size of the fractional region associated with the selection pane along the independent variable axis is user specified.

52. (original) The system of Claim 34, wherein the size of the fractional region associated with the selection pane along the independent variable axis is prescribed.

53. (original) The system of Claim 52, wherein the prescribed size of the fractional region along the independent variable axis amounts to 25 percent of the overall length of the histogram currently displayed in the graphic data presentation sector.

54. (original) The system of Claim 34, wherein the selection pane is moved along the independent variable axis of the histogram by the user to highlight a desired portion thereof.

55. (original) The system of Claim 34, wherein the user continues to select a portion of the currently-displayed histogram highlighted by the selection pane each time a previous selection has resulted in a new histogram being computed for just those search results items associated with the selected portion of the histogram and displayed in the graphic data presentation sector.

56. (original) The system of Claim 34, wherein said search results window further

comprises an overview sector, wherein the overview sector continuously displays an overall histogram computed from the complete set of search results in terms of said user-selected independent variable corresponding to a common attribute of at least some of the search results.

57. (original) The system of Claim 56, wherein said search results window further comprises an indicator pane covering the portion of said overall histogram displayed in the overview sector corresponding to the search results items used to compute the histogram currently displayed in the graphic data presentation sector, said indicator pane being visually distinguished from the remaining parts of the overall histogram.

58. (currently amended) A computer-readable storage medium having computer-executable instructions stored thereon for graphically displaying the results of a search to a user on a display device via a search results window, said computer-executable instructions ~~comprising~~ operable to:

~~computing~~ compute a clustering of the search results items in terms of a user-specified independent variable corresponding to a common attribute of at least some of the search results to form a plurality of cluster subdivisions each comprising a portion of the search results items within a particular range of the independent variable determined by the clustering; and

~~displaying~~ display a graphic data presentation sector in the search results window which comprises,

a series of said cluster subdivisions displayed in the order dictated by the independent variable, wherein each subdivision is visually distinguished from the other subdivisions and has a length along the axis of the independent variable proportional to the number of search results items within that subdivision, and

a histogram of the search results items, in terms of the user-specified independent variable, displayed over the cluster subdivisions, wherein the bars of the histogram each represent a histogram bin corresponding to a particular range of the independent variable and each have a length proportional to the number of search results items determined to be in the associated bin and extend perpendicular to

the independent variable axis, and wherein the independent variable range covered by the histogram bins associated with bars displayed within each cluster subdivision falls within the independent variable range of that subdivision.